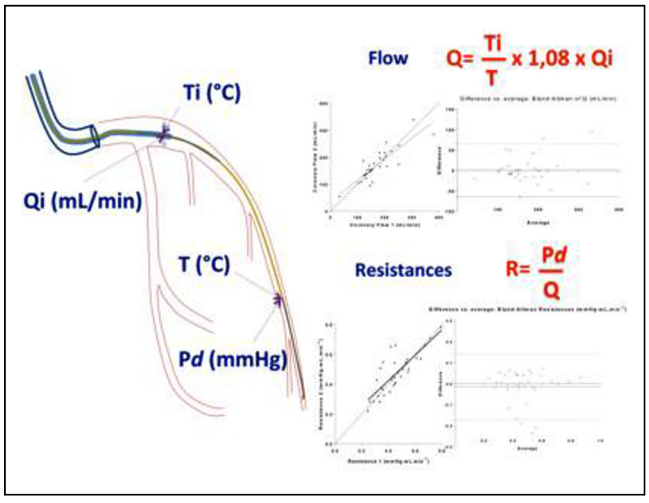
(Figure 1). The measurements itself take about 20 seconds. The entire set-up related to this measurement take about 5 minutes. No complications occurred during these measurements.

CONCLUSIONS Direct measurement of coronary blood flow and microvascular resistances to assess coronary microcirculation is reproducible and safe with this novel coronary infusion catheter. These measurements might be proposed to evaluate the effect of new treatment targeting the coronary microvasculature.



CATEGORIES IMAGING: FFR and Physiologic Lesion Assessment

KEYWORDS Coronary flow, Coronary microcirculation, Coronary Physiology

TCT-308

Continuous intracoronary infusion of saline at room temperature induces steady state maximal hyperemia

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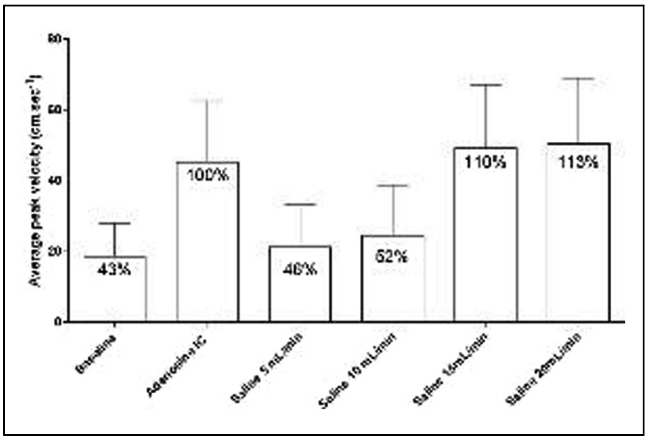
BACKGROUND A novel catheter was developed to infuse saline at room temperature and measure thermodilution-based absolute coronary flow and microvasular resistances. During the first tests in humans we realized that this infusion was accompanied by a marked increase in coronary blood flow. The present study aimed at quantifying the extent of this hyperemic effect.

METHODS In 10 patients without significant coronary artery disease, we performed intracoronary Doppler flow velocity measurements with intracoronary infusion catheter and saline infusion at increasing rates 5, 10, 15 and 20 mL/min compared with maximal hyperemia achieved by 100 to 200 micrograms adenosine intracoronary administration. In three patients the infusion was repeated during infusion of saline without the special side holes designed to optimally mix saline and blood.

RESULTS Twelve arteries were studied. Saline infusion at 5, 10, 15, and 20 mL/min achieved respectively 46, 52, 110, and 113% of maximal hyperemia achieved by Adenosine. As compared to baseline, there was no significant increase in flow velocity with saline infused at the rate of 5 and 10 mL/min. In contrast, infusion rates of 15 and 20 mL/min of saline at room temperature induced an increase similar to that induced by intracoronary adenosine. This hyperemic effect was very stable throughout the infusion. When the infusion of saline was done without the special side holes, saline did not produce any effect on coronary flow velocity even not at the highest infusion rates.

CONCLUSIONS Intracoronary saline administration with infusion catheter at a rate of 15 and 20 mL/min induces maximal, steady state hyperemia similar to Adenosine IC. Local shear stress is likely to play an important role in the mechanism of this hyperemic response.



CATEGORIES IMAGING: FFR and Physiologic Lesion Assessment

KEYWORDS Coronary flow velocity, Coronary Physiology, Hyperaemia

TCT-309

The impact of Flow and Gradient On The Invasive Assessment of Severe Aortic Stenosis

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BACKGROUND Current guidelines discourage aortic stenosis (AS) evaluation by direct pressure measurement if echocardiography (echo) is adequate. Crossing the valve at catheterization (cath) is a class II B recommendation due to potential stroke risk and old studies showing that echo derived Aortic Valve area (AVA) correlates highly with cath derived AVA. However several studies show sizable differences between echo and cath lab measurements. Furthermore patients with both low gradient (Gradient < 40 mm HG) and/or flow (Stroke Volume Index < 35) with normal ejection fraction constitutes a new challenge with no clear echocardiography criteria to classify them.

METHODS 120 patients with suspected AS by echo aged 61-94 underwent right and left heart cath by two operators with gradient assessed through simultaneous left ventricular (St. Jude) pressure wire recording of left ventricular pressure and fluid filled pressure catheter recording of aortic pressure measured > 5 cm above the valve. Cardiac output was calculated by thermodilution. Echos were from 5 different labs, interpreted by 18 different readers, and reviewed by 2 independent level III readers blinded to original reads and cath results to assess the quality of community-based readings.

RESULTS Cath Assessment of severity of AVA was discordant with echo by more than 0.3cm2 in 32% and 0.5cm2 in 12.5% of patients. Values changed significantly to over the surgical threshold of AVA <1cm2 in 20% of the patients. The correlation between Cath and echocardiography was weak (Pearson correlation of 0.4) While mean echo gradients had better correlation with cath gradients (Pearson correlation of 0.74). The discrepancy between echocardiography and cardiac catheterization assessment of the aortic stenosis severity was very limited in patients with high gradient when compared to those with low gradient (5% vs. 34%). The discrepancy was witnessed equally in both low flow and normal flow patients (19% vs. 21%). No clinical strokes or TIA were observed in the 30 days after cardiac catheterizations.

CONCLUSIONS While echocardiography is very predictive of the severity of AS in patients with high gradient, it is very limited in discriminating patients with paradoxical low flow/ low gradient. Invasive hemodynamic assessment can be beneficial in this emerging entity of aortic stenosis.

CATEGORIES IMAGING: FFR and Physiologic Lesion Assessment

KEYWORDS Aortic stenosis, Pressure wire